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APHIDIDAE OF SOUTHERN CALIFORNIA I

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Under this title we propose to make an extended series of studies on the plant lice found in Southern California, with the hope that they may eventually be gathered in a complete manual of the group for this region. Many of the earlier species and even generic references must of a necessity be merely tentative, all of our knowledge of the group in America being, so far, extremely fragmentary.

Lachnus californicus, n. sp.

WINGED VIVIPAROUS FEMALE.—Length 1.6 mm., width 0.5 mm., wing expansion 5.3 mm. Prevailing color—green, but individuals are found varying all the way between green and brownish-yellow. The eyes and abdominal dots are red. (Figure 1.)

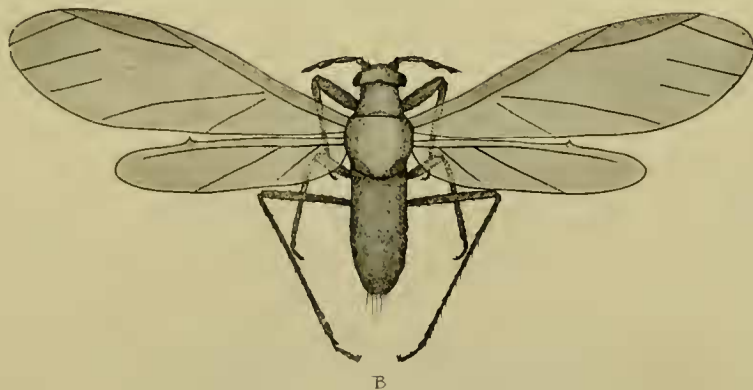


Figure 1. *Lachnus californicus*

Head—Short and nearly as wide as thorax, with short hair on frontal margin between the antennae. Compound eyes—large, round, red. *Antennae* (Figure 5, K) arise from no frontal tubercles, somewhat darker than the body, shorter than body 0.67 mm. long, six-jointed, hairy, with an apical nail-like process on the fifth article. The lengths of the respective articles are: I 0.07 mm., II 0.08 mm., III 0.26 mm., IV 0.13 mm., V 0.13 mm. The sensoria are distributed as follows: I and II none, III four large and one small cir-

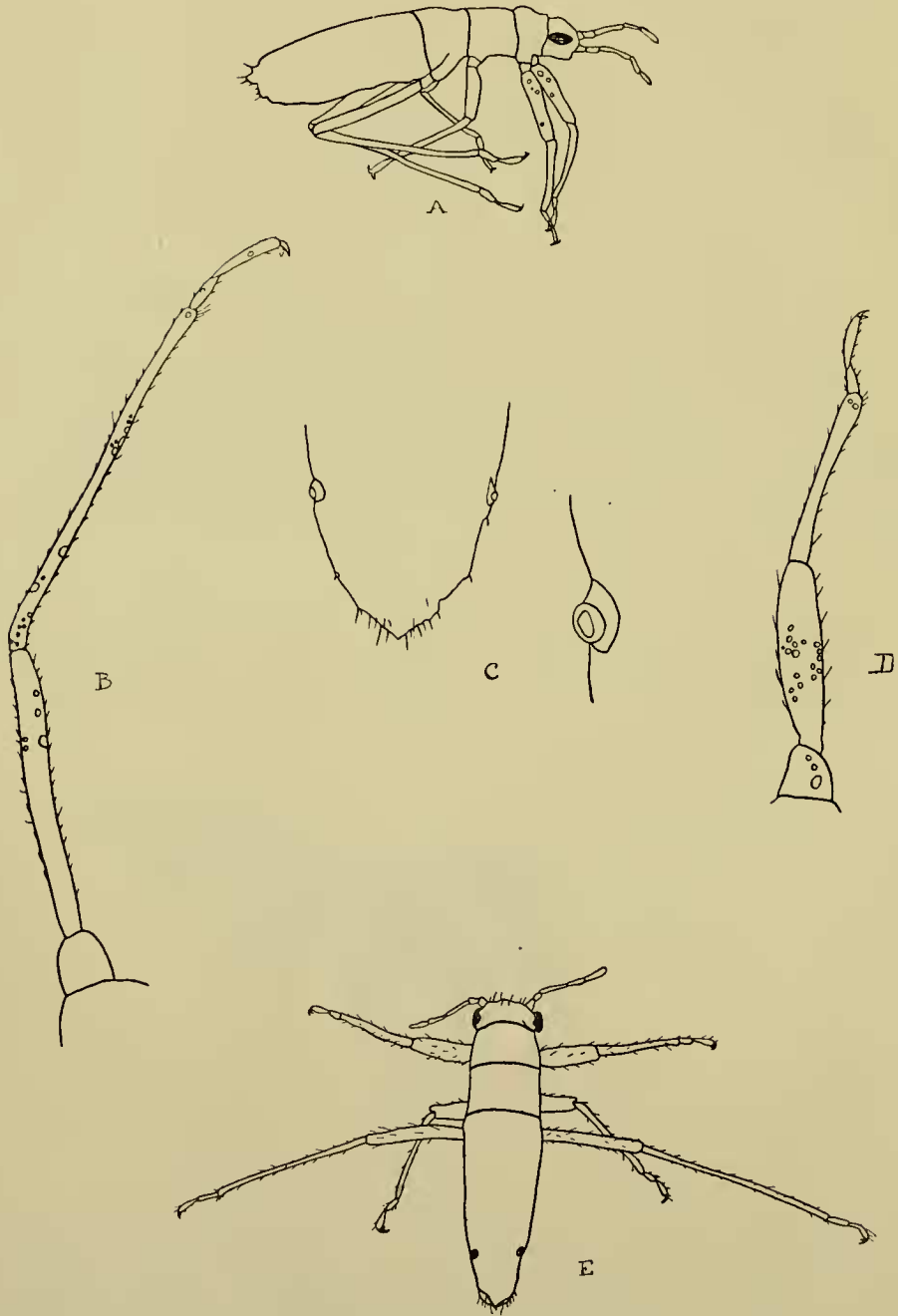


Figure 2. *Lachnus californicus*

cular, IV one large circular, V one terminal surrounded by five marginal—all in the apical process. *Pro-thorax*—lateral tubercles wanting. *Rostrum*—not half as long as the body. *Abdomen*—very indistinctly segmented and covered with numerous red dots. *Cornicles*—truncate, nearly obsolete. *Legs*—Hairy, very long, due to the enormous lengths of the tibia, and especially the tibia of the hind legs which are very long; they have no sensoria. The lengths of the tibia of the respective legs are: pro-thoracic 0.51 mm., meso-thoracic 0.57 mm., meta-thoracic 1.1mm. These long legs enable the aphid to move very rapidly. The hind legs are especially adapted for clinging to the slender pine needles along which it moves at a great rate. *Wings*—Entirely clear, *primary*—length 2.4 mm., width 0.75 mm. *Cubitus*—well defined. *Stigmal*—nearly straight, marking lower margin of a narrow distinct stigma. *Radius*—straight, extending from stigmal vein to margin. Of the third oblique only two remnants remain, showing that it was undoubtedly once forked. The first and



Figure 3. *Rhopalosiphum violae*

second obliques are straight. They arise together about the middle of the cubitus and extend to the margin. *Secondary*—length 1.63 mm., width 0.32 mm. Two discoidals. *Subcostal*—well marked and extending to tip of the wing. The *first discoidal* arises from the sub-costal near the base and extends nearly to the margin of the wing. The *second discoidal* arises from the sub-costal at a distance from the first discoidal equal to the distance from the first discoidal to the base of the wing and extends nearly to the margin. *Cauda*—rounded, slightly hairy. *Style*—obsolete.

APTEROUS VIVIPAROUS FEMALE.—(Figure 2.) Length 1.6 mm., width 0.5 mm. Differs from the winged form as follows: On the antennae (Figure 5, I) the sensoria are distributed as follows: I and II none, III many large circular, IV four large circular, V one terminal surrounded by several marginal in the process. On the legs the sensoria are distributed as follows:

Pro-thoracic, three large circular on coxa, many smaller ones scattered along the femur; meta-thoracic, few on femur, many on tibia, one on the tarsi.

NYMPH OF-APTEROUS VIVIPAROUS FEMALE.—These young are about one-seventh as large as the adult and are like them in color and form. The antennae (Figure 5, J) are four-jointed, about 0.3 mm. in length; with an apical nail-like process on the last article. The respective lengths of the articles are as follows: I 0.075 mm., II 0.15 mm., III 0.038 mm., IV 0.037 mm. There are no sensoria. The abdomen is more distinctly segmented than in the adult form. The rostrum is nearly as long as the body.

Common on some cultivated pines at Claremont, California, during the winter of 1908-09. Their presence would pass unnoticed except for beating the boughs which yields many specimens of this long-legged active species. Like certain other *Lachnus* it presents some strong affinities with the genus *Schizoneura*. It seems to find its nearest relative in *Lachnus agilis* Kalt., but differs in wing formation and other prominent features.

***Rhopalosiphum violae*, n. sp.**

WINGED VIVIPAROUS FEMALE.—Length 1.4 mm., width 0.75 mm.. wing expanse 6.05 mm. Prevailing color—dark wine-red. Legs, antennae, cornicles, and style—pale brown. (Figure 3.)

Head—Nearly as broad as long; considerably narrower than thorax. Compound eyes—large with long terete (ocellar—?) tubercles just behind near the posterior border. *Antennae* (Figure 5, O) arise from large prominent frontal tubercles and are transversely scabrous with a basal nail-like process on article VI; are longer than the body, 2.34 mm., and are made up of six joints. The lengths of the respective articles are as follows: I 0.08 mm., II 0.05 mm., III 0.01 mm., IV 0.51 mm., V 0.46 mm., VI 0.84 mm. The sensoria are distributed as follows: I and II none, III large number—large and circular, IV four large circular, V one large circular on distal end, VI one large terminal and several smaller marginal in the process. There are several terminal sense hairs on tip of this article. *Rostrum*—half as long as the body. *Pro-thorax*—no distinct lateral tubercles. *Abdomen*—smooth. *Cornicles*—incrassate, almost clavate in form, 0.25 mm. long. *Legs*—slightly hairy, moderately long, without sensoria. *Wings*—*Primary*, length 2.65 mm., width 0.98 mm., veins well marked, broadly clouded along margins. The cubitus is distinct, separating off a broad well-defined stigma of trapezoidal shape. The radius is sharply curved. Of the three obliques, the third is twice forked, the second curves in slightly near the margin, the first is straight. *Secondary*—length 1.3 mm., width 0.51 mm. Have a well-defined *sub-costal* extending the entire length, with two discoidals. Of these the first arises from the sub-costal a third of its distance from the body, and the second arises from the sub-costal two-thirds of its distance from the body to the wing-tip. *Style*—prominent and somewhat upturned.

APTEROUS VIVIPAROUS FEMALE.—Length 1.2 mm., width 0.70 mm. Differs from winged form as follows: No sensoria and fewer sense-

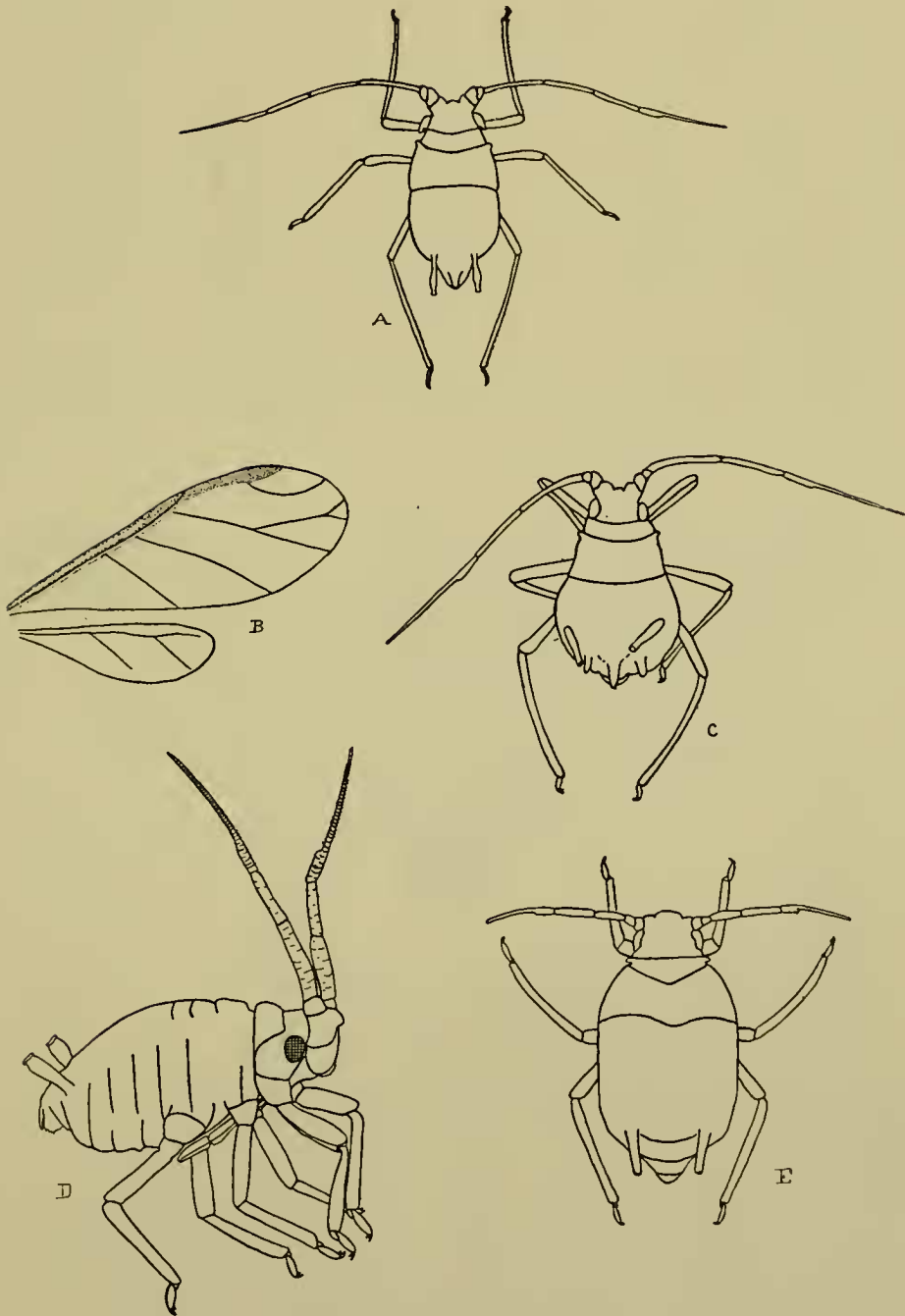
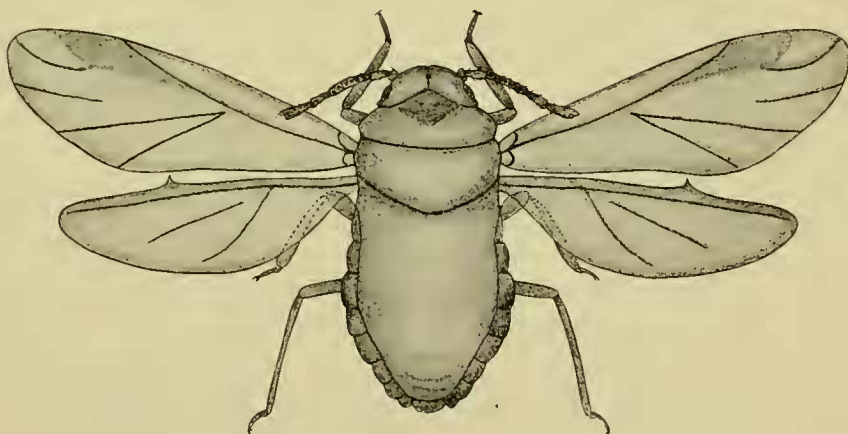


Figure 4. *Rhopalosiphum violae*

hairs on the antennae (Figure 5, N). The cornicles are usually longer, in this case being 0.27 mm. in length. In one individual there were two distinct tubercles arising from the abdomen just outside of the cornicles. (Figure 4, A and C.)

NYMPH OF APTEROUS VIVIPAROUS FEMALE.—These young are about one-sixth the size of the adult and are like them in most respects. In color they are somewhat lighter in shade—the eyes, however, are very dark. The antennae are made up of but five joints, the fifth being very long, with basal nail-like process. All of the articles except the first two are transversely scabrous. They have no sensoria. The rostrum is longer than the body. The cornicles are short, stout, and clavate in form. The style is obscure. (Figure 4, D.)

Taken from the lower side of leaves of the common cultivated blue violet at Claremont, Calif., Nov. 12, 1908. In no case were they found in any considerable numbers on any single plant, but occurred in twos and threes on a leaf.



B

Figure 6. *Pemphigus raditicola*

***Rhopalosiphum violae* (form ?)**

On the same plants and mingled with the wine-colored forms described above are found numerous green individuals, both winged and apterous, which differ in some characters supposedly of generic value. Possibly one or other of the forms may be a migrant generation. Although these two forms are closely associated on the same leaves of the cultivated blue violet, there is a chance that the green forms are a different species after all. With the coming of the spring broods this can be ascertained more definitely. In the meantime a full description of the green form is here given.

WINGED VIVIPAROUS FEMALE.—Length 1.69 mm., width 0.8 mm. Prevailing color—dark green. *Legs*—lighter. *Thorax*—darker. (Figure 4, B.) *Head*—Nearly as broad as long, and considerably narrower than the



Figure 5. A, B, C, *Rhopalosiphum violae*; D, E, *R. violae* (form ?); F, G, H, *Pemphigus radticicola*; I, J, K, *Lachnus californicus*; L, M, *Rhopalosiphum violae* (form ?); N, O, *Rhopalosiphum violae*.

thorax. Compound eyes—large and dark, with long terete (ocellar?) tubercles just behind near the posterior border. Antennae (Figure 5, L) arise from large frontal tubercles, are six-jointed, 1.83 mm. long, transversely scabrous, with a basal nail-like process on the sixth article. The lengths of the respective articles are as follows: I 0.07 mm., II 0.09 mm., III 0.4 mm., IV 0.22 mm., V 0.3 mm., VI 0.75 mm. The sensoria are distributed as follows: I and II none, III row of six large circular, IV one large circular near middle, V one large circular near distal end, VI one large terminal surrounded by several small marginal in the process. *Pro-thorax*—with distinct lateral tubercles. *Rostrum*—half as long as body. Abdomen covered with numerous short tubercles. *Cornicles*—cylindrical, 0.25 mm. long, and transversely scabrous.

Wings—Clear. *Primary*—length 2.24 mm., width 0.83 mm. *Cubitus*—well defined. *Stigma*—long and slender. *Radius*—sharply curved. The third oblique is twice forked. (In this form the second fork of the third oblique is much nearer the margin than in the wine-red form.) The first and second obliques are straight and extend to the margin. *Secondary*—length 1.12 mm., width 0.37 mm. They have well defined subcostal extending to the tip of the wing and two discoidals. The first discoidal joins the sub-costal at a distance of one-third and the second discoidal joins it at two-thirds distance from base to wing-tip. *Style*—prominent, conical, hairy.

APTEROUS VIVIPAROUS FEMALE.—Length 1.67 mm., width 0.78 mm. Differs from winged form as follows: The distribution of the sensoria (Figure 5, M) is as follows: I, II, III and IV none, V one large circular near the distal end, VI one large terminal in the nail-like process. Sense-hair—few. *Cornicles* .21 mm. long. (Figure 4, E.)

It will be noted that the pro-thoracic tubercles of this green form ally it apparently to the genus *Macrosiphum*. It is, however, for the present left with *Rhopalosiphum violae*.

***Pemphigus radicolica*, n. sp.**

WINGED VIVIPAROUS FEMALE.—Length 1.9 mm., width 0.8 mm., wing expanse 4.6 mm. Prevailing color—dark brown. *Thorax* and *antennae*—somewhat darker. *Legs*—lighter. *Shape*—nearly cylindrical. (Figure 6.)

Head—Short, broader than long. Vertex bisected by a distinct suture. Narrower than thorax. Compound eyes—large, with prominent terete (ocellar?) tubercles just behind near the posterior border. *Antennae* (Figure 5, H) do not arise from frontal tubercles; five-jointed; 0.85 mm. long; with an apical nail-like process on last article. The lengths of the respective articles are as follows: I 0.06 mm., II 0.12 mm., III 0.38 mm., IV 0.12 mm., V 0.17 mm. The distribution of the sensoria is as follows: I and II none, III many large and small circular ones, IV one large terminal and one large marginal near the proximal end, V one large cup-shaped terminal surrounded by several irregular marginals in the process. *Pro-thorax*—without lateral tubercles. *Rostrum*—half as long as body. *Abdomen*—very distinctly segmented along sides. Breathing spiracles along sides are very prominent, and raised on

small tubercles. *Cornicles*—wanting. *Legs*—short, hairy, without sensoria. *Wings*—sub-hyaline, the veins lightly pigmented along margins. *Primary*—length 1.9 mm., width 0.67 mm. *Cubitus*—well defined. *Stigma*—short and broad, nearly trapezoidal in shape. *Radius*—curved. The third oblique presents but two straight remnants near the margin. A slight vein-trace shows a connection to form the forks. The first and second obliques arise from the same point near the cubitus and fork towards the margin. *Secondary*—length 1.5 mm., width 0.47 mm., with two discoidals. The first and second discoidals arise from the same point on the sub-costal about one-third its length from the wing base and extend nearly to the margin. The first curves away from the base while the second oblique curves towards the base of the wing. *Cauda*—rounded and hairy. *Style*—wanting.

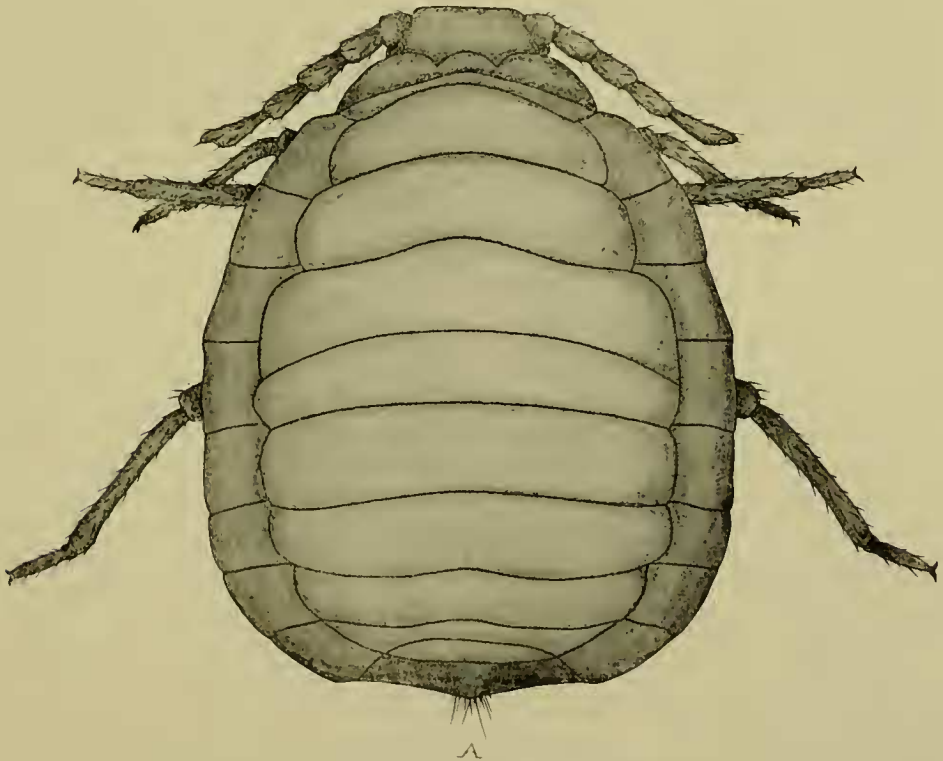


Figure 7. *Pemphigus radicolica*

APTEROUS VIVIPAROUS FEMALE.—Length 1.42 mm., width 1.19 mm. Differs from the winged form as follows: Prevailing color—mealy-white, sometimes shading off into a gray. The eyes are very dark.

Head—Without bisecting suture, nearly straight across frontal margin. Compound *eyes*—round, very small *antennae* (Figure 5, G)—lengths of the articles as follows: I 0.06 mm., II 0.13 mm., III 0.16 mm., IV 0.09 mm., V 0.18 mm.—total length 0.62 mm. The sensoria are distributed as follows: I, II and III none, IV one large circular near distal end, V one large cup-

shaped terminal surrounded by several marginals in the process. *Abdomen*—deeply segmented. (Figure 7.)

NYMPH OF VIVIPAROUS APTEROUS FEMALE.—These young are about one-tenth as large as the adult, and resemble them in most respects. The body is very hairy. The *antennae* (Figure 5, F) are longer than the body, very hairy, four-jointed, 0.53 mm. long (nearly as long as in adult), with an apical nail-like process on last article. The comparative lengths of the articles are as follows: I 0.05 mm., II 0.09 mm., III 0.19 mm., IV 0.19 mm. The sensoria are distributed as follows: I and II none, III one large circular near distal end, IV one large cup-shaped terminal surrounded by several marginal in process. *Rostrum*—longer than body. *Abdomen*—slender compared with adult.

This aphid was first taken at Santa Paula, Calif., Nov. 1, 1908, where it occurred in considerable numbers on the roots of *Amaranthus retroflexus*. At Claremont it occurs in great numbers on the roots of *Solanum douglasii*. For several months I was unable to obtain winged specimens, which led me to place it in the genus *Tychea*. Late in January were obtained the winged form which showed it to belong to the genus *Pemphigus*.